Improvised Primary Explosives

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WARNING!

Explosives are danegerous. In most countries it's forbidden to make them.
Use your mind. You as an explosives expert should know that.

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End

PRIMARY EXPLOSIVES

ACETONE PEROXIDE

Synonyms: tricycloacetone peroxide, acetontriperoxide, peroxyacetone, acetone hydrogen explosive

FORMULA:
$C_9H_{18}O_6$

VoD:
3570 m/s @ 0.92 g/cc.
5300 m/s @ 1.18 g/cc.

EQUIVALENCE:
1 gram = No. 8 cap
.75 g. = No. 6 cap

SENSITIVITY:
Very sensitive to friction, flame and shock; burns violently and can detonate even in small amounts when dry.

DRAWBACKS:
in 10 days at room temp. 50 % sublimates; it is best made immediately before use.

COMPATIBILITY:
picric acid, R.D.X, T.N.T., PETN, Tetryl, chlorates and metals

ADDITIONAL INFORMATION:
AP is best stored under alcohol; before pressing in detonator (at least 100 pounds pressure) moist with alcohol. Let detonator dry for 1 day at room temperature.
Lead block expansion 10 grams: 250 cc.

PREPARATION #1:

Chemicals:
Hydrogen peroxide (30 %)
Acetone
Sulfuric acid (20 %)or hydrochloric acid (30 %)

Materials:
glass beaker (500 ml)
ice water bath

DDNP

4,6-Dinitrobenzene-2-diazo-1-oxide,

Synonyms: DINOL, Diazodinitrophenol

FORMULA:
$C_6H_2N_4O_5$

VoD:
4400 m/s @ 0.9 g/cc.
6600 m/s @ 1.5 g/cc.
6900 m/s @ 1.6 g/cc.
7000 m/s @ 1.63 g/cc.

EQUIVALENCE:
8 cap = 0.7 g.
6 cap = 0.5 g.

SENSITIVITY:
Friction: less sensitive as mercury fulminate.
Small quantities burn like guncotton. Will detonate in quantities larger than 6 g.

DRAWBACKS:
Obscure chemicals needed.

COMPATIBILITY:
Nearly all high explosives and metals.

ADDITIONAL INFORMATION:
Lead block expansion: 326 cc./10 grams

PREPARATION:

Chemicals:
sodium hydroxide
picric acid
sulfur
sulfuric acid (conc.)
potassium or sodium nitrite
water

Materials:
2 glass beakers
glass stirring rod
filter papers

About 3600 m/s @ 5,38

EQUIVALENCE:
1.8 grams are needed for a #8 cap

SENSITIVITY:
not light sensitive, moderately friction sensitive, burns violently, may detonate in small amounts.

DRAWBACKS:
not very powerful

COMPATIBILITY:
Can be mixed with most high explosives.
Avoid contact with copper and brass.

ADDITIONAL INFORMATION:
First prepared by the Swiss chemist Dr. Alfred Stettbacher.
Caps loaded with double salts are stable and have a long storage life.

PREPARATION:

Chemicals:
nitric acid (70%)
silver dime or equivalent silver metal
acetylene /calcium carbide + water/
alcohol

Materials:
2 test tubes 50 ml
glass beaker
filter paper

MANUFACTURE:

1. Fill a test tube with 18 ml of 70 % HNO_3 ,
add a silver dime or equivalent silver metal in the acid.

2. If the silver does not dissolve completely, heat the acid carefully until it does.
NOTE: The red-brown gas given off by this reaction (NO_2) is highly toxic and should be avoided.
A green solution should remain.

3. Heat the green liquid in a water bath until crystals form.
Continue heating until the crystals dissolve again.
Let test tube sit in water.

4. If you cannot obtain acetylene, generate it by adding water to calcium carbide.
(Two tsp. calcium carbide + ten tsp. water)

Bubble the acetylene through the green solution for 5-8 min.

5. Flakes begin to form in the liquid and brown vapors are given off.
Remove solution from water bath and allow to cool.

6. Filter the liquid through the paper, green crystals are formed.
Wash these crystals in the 2nd tube with 45 ml alcohol, they will turn white.
Filter again.
This is pure silver primary explosive.
Store under alcohol before use.

HMTD

Hexamethylenetriperoxidediamine

Synonyms: none

FORMULA:
$C_6H_{12}N_2O_6$

VoD:
4511 m/s @ 0.88 g/cc.
5100 m/s @ 1.10 g/cc.
Lead Block: 340 cc.

EQUIVALENCE:
0.75 gram HMTD has the power of a reinforced
10 cap
0.5 is equivalent to a strong # 8 cap

SENSITIVITY:
Very friction sensitive!!
Burns like nitrocellulose. Detonates in greater amounts.
Sensitive to shock, flame and heat.

DRAWBACKS:
Tend to sublimate at room temperature.

COMPATIBILITY:
Can be used with high explosive boosters.
CAUTION: Do not store HMTD in metal containers and detonators . It will attack aluminum, copper, brass, zinc, antimony, iron and lead, even when dry.
The detonators must be outlined with a straw, so that HMTD can't attack the metal.

ADDITIONAL INFORMATION:
High performance initiating explosive.
Press HMTD with 100 pounds of pressure in its moist form.

PREPARATION #1 (Tenney L. Davis "The Chemistry of Powders and Explosives")**:**

4. Add slowly 4 ½ tsp. citric acid to the solution.

5. The yield is increased if you stir the mixture for 30 min. Let mixture sit for 24 hours.

6. Filter the HMTD out , wash with distilled water and then with alcohol.

7. Store moist in a film canister.

PREPARATION #3:

Chemicals:
3 % hydrogen peroxide
ammonium sulfate (fertilizer grade)
37 % formaldehyde solution

Materials:
1000 ml glass beaker
heating source
stirring rod

MANUFACTURE:

1. Place 500 grams of 3 % H_2O_2 in the beaker.

2. Add 50 grams ammonium sulfate, stir until it dissolves.

3. When the liquid is heated to 55 ° C immediately add 5.3 g. of the formaldehyde soln. , stir well and remove from heating source.

4. Let mixture sit for 24 hours. Filter and purify as above.

LEAD AZIDE

Synonyms: none

FORMULA:
$Pb(N_3)_2$

VoD:
4630 m/s @ 3.0 g/cc.
5180 m/s @ 4.0 g/cc.

EQUIVALENCE:
Use 0.5 - 0.75 g for a strong detonator as a base charge fired with mercury fulminate or HMTD.

SENSITIVITY:
Doesn't always ignite from spark.
Not extremely shock sensitive.
Large crystals may explode when broken or of internal tensions.

DRAWBACKS:
Sodium azide which is used for making it, is expensive , dangerous and difficult to make or to get.

COMPATIBILITY:
Reactive with copper.
Use aluminum or zinc tube.

ADDITIONAL INFORMATION:
Most popular primer used in modern blasting caps.
Lead block expansion : 110 cc./10 grams

PREPARATION

<u>Chemicals:</u>
sodium azide
sodium hydroxide
lead nitrate
dextrin
water

<u>Materials:</u>
hot plate
beaker
water bath
air pump
plastic tube for air pump

MANUFACTURE:

1. Prepare the following two solutions:
Solution # 1: Dissolve 2 grams of sodium azide and 60 milligrams sodium hydroxide in 70 ml distilled water.
Solution #2: Dissolve 7 grams of lead nitrate and 400 milligrams of dextrin in 90 ml distilled water.
Adjust #2 to pH 5 by adding dilute sodium hydroxide to it.(drop by drop and stirring after each addition).

2. Place solution #2 in a 300 ml beaker and place in a water bath.
Heat to 60°C.
Place tube from the air pump into the beaker, so that it produces a moderate agitation.

3. Slowly, drop by drop, add soln. #1 not more than 4 ml per minute.

4. After #1 has been added let mixture cool to room temperature while air from the air pump still flows.

5. Filter the solution and discard the liquid.
Wash the crystals 4 times with 40 ml water.
Let dry at room temperature.

Yield: 4 grams, enough for 8 detonators.

LEAD PICRATE

FORMULA:
$C_6H_2Pb(NO_2)_3$

VoD:
4400 m/s

EQUIVALENCE:
Not as good as HMTD or DDNP but 1 gram works nicely.

SENSITIVITY:
very sensitive to friction, shock, flame and heat.
Burns violently and can detonate in small quantities.

DRAWBACKS:
Not extremely powerful.

COMPATIBILITY:
Lead azide is best used with a picric acid booster. Avoid copper contact.

ADDITIONAL INFORMATION:
Lead compounds are highly toxic!

PREPARATION:

Chemicals:
lead monoxide (litharge)
methanol
picric acid

Materials:
glass beaker
wooden stirring rod or glass rod

MANUFACTURE:

1. Dissolve in the beaker 2 grams of picric acid in 10 methanol.
Stir.

2. Continue stirring while adding slowly 2 grams of litharge.
Stir.

3. Stir until all alcohol is evaporated, avoid lumps when mixture thickens.

4. For a better stability heat the lead picrate on a water bath for 2 hours at 100° C.

MEKAP

Methyl-ethyl-ketone peroxide

Synonyms: none

I've never found exact characteristics in chemistry books so I can't tell you the exact formula or detonation velocity.
But it has about the same power and velocity as acetone peroxide.
They are chemically related substances.
Work with 1 gram for a very strong cap.

Here's something for European readers:
I've often seen in drugstores a hardener containing 33 % by weight MEKP. The cost is about $2 for 200 ml. It's a syrupy liquid, the liquid is allowed to stand for a few days at room temperature.
The white powder remaining is MEKP and should be handled like acetone peroxide.

PREPARATION:

Chemicals:
Methylethylketone (also known as 2-Butanon)
Hydrogen peroxide (30 %)
Sulfuric acid (30 %) or hydrochloric acid (30 %)

Materials:
Glass beaker or plastic film canister (PE)
Filter paper
(heating source)

MANUFACTURE:

1. Cool the ingredients down to approx.
0°-10° C

3. Mix 6 ml of the MEK to 10 ml of the H_2O_2

2. Add slowly 0.5 ml of the HCl or H_2SO_4 to the mixture.
Let sit overnight.

3. If no MEKAP precipitates, heat the mixture in a water bath at 40° C for 2 hours.

4. Handle the MEKAP like Acetoneperoxide.

MERCURY FULMINATE

Synonyms: none

FORMULA:
$C_2HgN_2O_2$

VoD:
3500 m/s @ 2.0 g/cc.
4250 m/s @ 3.0 g/cc.
5000 m/s @ 4.0 g/cc.

EQUIVALENCE:
Use 1 g for #8 cap.
.75 g for #6 cap

SENSITIVITY:
Can detonate even in small quantities.
When one crystal is ignited, it deflagrates.
Heat, shock ,friction must be avoided.

DRAWBACKS:
Mercury is highly toxic. The fumes given off by this reaction are highly toxic, too.
Loading the crystals could become a problem.

COMPATIBILITY:
Mercury fulminate is stable and do not attack most metals and high explosives.

ADDITIONAL INFORMATION:
The first commercial used primary explosive, since Nobel's discovery of initiating high explosives with primary explosives in 1867.

PREPARATION:

Chemicals:
nitric acid (70 %)

ethanol (pure or denatured)
mercury metal (switches, thermometers)

Materials:
2 glass beakers (200 ml)
heating source
filter paper

MANUFACTURE:

1. Place in the beaker 12 ml of nitric acid. Add 1 gram of mercury.

2. Let mixture sit until all mercury has dissolved without shaking or swirling.
Red fumes are produced at this process which must be avoided.
Let cool.

3. In the 2nd beaker warm 90 ml ethanol.
Add the mercury/nitric acid to this alcohol.

4. The reaction starts in about 5 minutes and takes about 25 minutes until it is over.
Red toxic fumes are also given off.

5. Filter the gray mercury fulminate out and wash with 60 ml ethanol.

Store under water until ready for lading.

"MILK BOOSTER"

This is another explosive booster which is less known.
I don't know of which substance actually it is, but I think it's casein nitrate.
I've found the recipe in a very old chemistry book.
Here, I don't know the exact VoD, but it is written that 30 parts of it as a booster, will detonate pure ammonium nitrate.
Use fresh milk. Do not use powdered, dry, or instant milk.

PREPARATION:

Chemicals:
milk
nitric acid (70 %)
sulfuric acid (96%)
vinegar (common household)
destilled water
baking soda

Materials:
tablespoon
3 glass beakers
ice bath
1 filter paper (acid resistant is optimal)

MANUFACTURE:

1. Place 400 ml milk in a glass beaker.
Add 2 tbs. of vinegar (5-6 % acid).
Let sit overnight.

2. In the next morning remove the precipitate sludge with your spoon.
Dry this white stuff in the sun until a white substance remains.
Powder the substance.
Yield: about 5-6 grams

3. In a 2nd beaker fill in 40 ml of 70 % (d= 1.42) nitric acid.
Place the beaker in an ice bath until it is cooled down to 10°C. Then add 60 ml of the sulfuric acid.

4. Now, carefully stir in the 5-6 grams of (0.5 grams at one time) the "milkpowder" while the temperature is kept below 20° C.
If the temp. rises close to the 20° mark, stop the addition until it begins to fall.
This step will take about 15 to 20 minutes.

5. After all "milkpowder" is stirred in, you should have a jelly or a quolled substance.
Let sit for 30 minutes.

6. Carefully pour the acid and the nitrated stuff through an acid resistant filter paper.

7. Neutralize the acid with common baking soda water.

8. wash the nitrated "milkpowder" with at least 5 tbs. of destilled water, and at last with a 5%- baking soda/water solution.

9. The white primary explosive is stored in its moist form.

NITROMANNITE

Synonyms: Mannitol hexanitrate

FORMULA:
$C_6H_8N_6O_{18}$

VoD:
8260 m/s @ 1.73 g/cc.

EQUIVALENCE:
It is a booster with some primary properties.
Use as a 2 grams booster charge with 0.5 grams of DDNP and it will set off nearly every type of HE (**H**igh **E**xplosive).

SENSITIVITY:
Nitromannite is as shock sensitive as nitroglycerin. It explodes by the local overheating from a match flame.

DRAWBACKS:
Mannose is not easily available.

COMPATIBILITY:
Good with most metals and primary explosives.

ADDITIONAL INFORMATION:
A mix of nitromannite and tetracene (60/40) yields a powerful and brisant primary explosive.
This primary explosive detonates from moderate heat.

PREPARATION:

Chemicals:
mannose
nitric acid (90 % or higher)
sulfuric acid (96 %)
table salt
baking soda
water
ethanol

Materials:
glass beaker (500 ml)
filter paper
thermometer

MANUFACTURE:

1. Prepare an ice bath consisting of table salt and frozen water.
35 ml of nitric acid is placed in the beaker.

2. Slowly add, while stirring with the thermometer, 10 grams of mannose.
The temperature is not allowed to rise above
0° C.

3. When all is dissolved, add 55 ml of sulfuric acid, drop by drop, to the nitric acid/ mannose mixture. Temperature is kept below 0° C.

4. The mass is filtered through a few coffee filters (5 or so at one time) or one strong filter paper ,and first washed with water, then with baking soda solution and with water again.

5. The crude product is dissolved in boiling ethanol.
The alcohol is allowed to chill, and filtered through a common coffee filter.

6. The remaining liquid is heated again and water is added until it turns turbid.

7. The mixture is allowed to chill and the crystals are filtered out.
Yield: 20-23 grams.

SODIUM AZIDE

This not actual a primary explosive, but it is used in the manufacture of lead azide.
Its preparation is extremely dangerous, because of the use of hydrazine.

PREPARATION:

Chemicals:
hydrazine hydrate (85 %)
butyl or isopropyl nitrite
ethyl alcohol
water
sodium hydroxide

Materials:
glass distilling flask
heating source
water bath
glass stirrer

MANUFACTURE:

1. Dissolve 5 grams of sodium hydroxide in 50 ml ethanol.

2. This mixture is poured down in a 100 ml distilling flask containing 6 ml hydrazine hydrate.

3. Carefully add 10 ml of butyl or isopropyl nitrite, heat the mixture on a water bath.

4. Add 12 ml more of the nitrite, slowly, so that the mixture refluxed slowly. This will take about one hour.

5. After heating additional 15 minutes, the mixture is cooled to room temperature and the white crystalline powder is collected and washed with alcohol.
This *should* be sodium azide.

<u>TACC</u>

Tetraaminecopper (II) chlorate

FORMULA:
$Cu(NH_2)_4ClO_3$

VoD:
about 4300 m/s

EQUIVALENCE:
As powerful as lead picrate.

SENSITIVITY:
The same friction sensitivity as lead azide.
Deflagrates with a green flame.
Must confined before detonation.

DRAWBACKS:
Easily "deadpressed". Must be kept dry.

COMPATIBILITY:
With about all metals used for detonators.

PREPARATION:

<u>Chemicals:</u>
sodium chlorate
copper sulfate
strong ammonia water
methanol, ethanol or isopropyl
(use the ethanol or isopropyl, due to methanol is very toxic)

<u>Materials:</u>
glass beaker
plastic or glass bottle
plastic hose
filter paper

MANUFACTURE:

1. Place 15 grams of sodium chlorate in the beaker. Add 360 ml ethanol or methanol. To this, add 24 grams of copper sulfate.

2. Place the beaker in a hot water bath and boil at the boiling point for 30 minutes.
CAUTION:
Alcohol vapors are flammable and explosive;
methanol vapors and methanol itself is very toxic.
Keep the volume of the solution constant by adding alcohol.

3. Filter the green solution and discard the filter paper, save the liquid in a beaker.
The liquid should be copper chlorate solution.

4. In a glass bottle fill in 1500 ml strong ammonium hydroxide solution. Place a stopper with one hole on the bottle.
Place in the stopper a plastic hose.

5. Place the bottle with the ammonia in a hot water bath and bubble the ammonia with the plastic hose through the copper chlorate solution for 10 minutes.
Solution should turn first light blue and then to dark blue.

6. Continue bubbling for additional 10 minutes.

7. Reduce volume of solution by evaporating the alcohol in a hot water bath.

8. Filter the solution, collect the crystals, wash with 50 ml cold methanol or ethanol.

Let dry for 16-20 hours.

There's another option for an ammonia generator:

250 grams sodium hydroxide (lye) are placed in a bottle described above. To this add
500 grams ammonium sulfate , nitrate or chloride (fertilizer grades).
Add a little bit of water. It should start generate. When it stops generating add more water.

EXOTIC AND FRICTION PRIMERS

LEAD NITROANILATE

Synonyms: none

FORMULA:
?

VoD:
4000 m/s

EQUIVALENCE:
Same power as lead picrate.

SENSITIVITY:
Even small quantities detonate.

DRAWBACKS:
Complicated manufacture.

COMPATIBILITY:
Don't know exactly, but avoid metal contact due to its acidity.

ADDITIONAL INFORMATION:
I haven't tried this formula. Don't know if it works.
Have care preparing it. It's of questionable information.

PREPARATION:

Chemicals:
salicylic acid
hydrochloric acid
potassium chlorate
ethyl alcohol
sodium nitrite
lead nitrate

Materials:
heating source
a few beakers (3) two 1000 ml one 500 ml
glass stirring rod

MANUFACTURE:

PART 1:

Preparation of **chloranil**.

1. Prepare the following two solutions:

A: A slurry of 5.0 grams of salicylic acid and 100 ml hydrochloric acid is heated on a water bath to 80° C. Then add slowly 5.0 grams of potassium chlorate. Use the 1000 ml beaker.

B: Mix 5.0 grams potassium chlorate and 400 ml conc. hydrochloric acid (this is the most questionable information in this formula, it should give off highly toxic chlorine gas!!).

2. Let A sit on hot plate and add slowly B.

3. Heat at 80-90° C for four hours, let cool and filter the solution and wash with water.

Yield: 5.45 grams of yellow crystals melting point 190° C. Label it chloranil.

PART 2:

Preparation of **sodium nitranilate**.

1. 5.0 grams of chloranil and 200 ml ethanol is heated to boiling and a solution of 5.6 grams of sodium nitrite in 100 ml ethanol is added.

2. The mixture is heated under stirring for 30 minutes.

3. Filter the orange-gold crystals out wash with ethanol.
Yield: 1.85 grams.

PART 3:

Preparation of **lead nitranilate**.

1. A solution of 1.0 grams sodium nitranilate in 100 ml boiling ethanol is filtered.

2. Mix 2.9 grams of lead nitrate with 10 ml of water.
Pour the crystals of step 1. under stirring in the lead nitrate solution.

3. The mixture is stirred for 30 minutes.
Then the gold like crystals are filtered off and washed with water.
After drying at 80° C the product weighed 1.23 grams.

The substance ignites with a loud report on flame contact.

NITROGEN SULFIDE

Synonyms: none

FORMULA:
N_4S_4

VoD:
ca 5400 m/s

EQUIVALENCE:
As good as lead picrate. Slightly less brisant than mercury fulminate.

SENSITIVITY:
Very friction sensitive. Heat sensitive.
Small quantities blow off with a puff or fizzling. Larger amounts detonate.

DRAWBACKS:
Long preparation process. Some obscure chemicals are required.

COMPATIBILITY:
Use only copper tubing. Avoid contact with other metals.

PREPARATION:

Chemicals:
sulfur
chlorine gas generator
hydrochloric acid
manganese dioxide
benzene
ammonia gas generator see TACC
table salt
water
oil

Materials:
2 round bottom flasks each 500 ml in volume
1 one hole stopper for round flask
1 two hole stopper for other flask
2 plastic hoses
heating source
filter paper

MANUFACTURE:

1. In 1st flask place 100 grams of sulfur. The two hole stopper is place on it.
Heat the sulfur to 215° C (in an oil bath) until it melts.

2. In the 2nd flask prepare a chlorine (extremely toxic!!!) generator.
It is filled with 255 grams of hydrochloric acid and 53 grams of manganese dioxide is added in small portions. Chlorine gas is generated.
Place quickly the 1 hole stopper on the flask and insert a plastic hose.

3. In the 1st flask with the molten sulfur place one hose just through the stopper and the end of the hose is placed in a receiving bottle cooled by a cold water/table salt mix.
The hose from the chlorine generator is inserted through the two hole stopper in such way that the chlorine bubbles through the molten sulfur.

4. This reaction forms sulfur dichloride. The sulfur dichloride which evaporates is cooled by the bottle in the salted ice bath.
The chlorine bubbling is continued until the sulfur liquid no longer boils.
Continue heating for 10 min.

5. The receiving bottle should have caught most sulfur dichloride.
212 grams of this liquid is dissolved in 1700 grams of benzene.

6. Filter the solution so that no solids are contained in it.

7. Start your ammonia generator (TACC) and bubble ammonia gas through the benzene solution. A brown powder will collect at the bottom of the beaker.
Keep on bubbling until the brown powder dissolves and the mixture is turning yellow-orange. Small flocks of ammonium chloride are produced.

8. Warm the solution until it boils.
Filter.
To the filtered liquid immediately add 200 grams of fresh benzene.

9. Let the benzene evaporate and collect the pure nitrogen sulfide.

Nitrogen sulfide can be mixed with 20 % very dry potassium chlorate.

NITROSOGUANIDINE

FORMULA:
CH_4N_4O

VoD:
6000 m/s

EQUIVALENCE:

More powerful than mercury fulminate.

SENSITIVITY:
More sensitive to shock than mercury fulminate or lead azide.
Explodes on contact with conc. sulfuric acid.
Explodes with a zishing sound but totally flashless. Ignition temp.:165° C.

DRAWBACKS:
Nitroguanidine which used for preparing it, is itself a high explosive and difficult to obtain.

COMPATIBILITY:
It decomposes in contact with water. Mixtures with hygroscopic substances should be avoided.

PREPARATION:
Chemicals:
nitroguanidine
ammonium chloride
zinc dust
water
table salt

Materials:
thermometer
a few glass beakers (500 ml)
ice bath
filter paper

MANUFACTURE:

1. The beaker is placed in a normal ice bath (without salt) and 21 grams of nitroguanidine, 11 grams of ammonium chloride and 18 grams of zinc dust are stirred together with 250 cc. water.
Hold temperature between 20 - 25°.

2. After two hours the mixture should turn yellow.
This mixture is cooled in a salted ice bath to 0° or below.

3. Filter the solution and discard the liquid.

4. The crystalline substance is washed with four successive portions of 250 ml, each of water at 65°.

5. Let mixture sit overnight in the salted ice bath, collect the nitrosoguanidine and wash with water.

6. The product is dried at 40°.
Yield 8-9 grams.

TETRACENE

Synonyms:
1-Guanyl-4-nitrosaminoguanyltetracene

FORMULA:
$C_2H_8N_{10}O$

VoD:
ca 5300 m/s

EQUIVALENCE:
It is as efficient as mercury fulminate when initiated externally, that means by another primary explosive.
It can be used as a booster.

SENSITIVITY:
As sensitive as mercury fulminate. Explodes from flame without noise and black smoke.

DRAWBACKS:
Obscure chemicals needed.

COMPATIBILITY:
With all other high explosives and primers. Best mixed with nitromannite.

ADDITIONAL INFORMATION:
It has its greatest power if uncompressed.
Lead block expansion: 10 grams 155 cc.

thoroughly with water. The product is dried at room temperature and is stored in a bottle which is closed by means of a cork or rubber stopper.

CHLORATE PRIMERS

OR "FRICTION PRIMERS"

NOTE: All primers in this chapter must be mixed wet with a 5 % gum arabic solution. Parts are by weight. It's a good idea to add 1 % anti acid like chalk.

MIXTURE 1:
The potassium chlorate in this formula must be one-half powdered and one-half granulated.

Potassium chlorate: 2
Antimony sulfide : 1

MIXTURE 2:

PC : 56.2
Antimony sulfide : 24.6
Sulfur : 9.0
Ground glass : 10.2

MIXTURE 3:

PC : 44.6
AS : 44.6
Sulfur : 3.6
Meal powder : 3.6
Ground glass : 3.6

NOTE: <u>All the following primary explosives are not used commercially and therefore it's impossible to get exact detonation velocity, formula and other data.</u>

<u>CHLORATE-TRIMERCURY-ACETYLIDE</u>

PREPARATION:

<u>Chemicals:</u>
acetylene /calcium carbide + water/
mercuric nitrate
sodium chlorate

<u>Materials:</u>
glass beaker 300 ml
acetylene generator (see above)

MANUFACTURE:

1. Dissolve 3 grams of mercuric nitrate and 1 gram of sodium chlorate in 200 ml of distilled water.

2. A stream of acetylene is led into the solution. After a few minutes white crystals are formed then turned to a grayish color.

3. Filter the gray crystals out, wash with water and dry. Ignition temp.: 150° C.

<u>TRIHYDRAZINEZINC (II) NITRATE</u>

PREPARATION:

<u>Chemicals:</u>
zinc nitrate (zinc + nitric acid)
95 % hydrazine (TOXIC!!!)
ethyl alcohol

<u>Materials:</u>

two test tubes 50 ml
filter paper

MANUFACTURE:

1. Prepare the following to solutions:
#1: 5 grams of zinc nitrate into 25 ml of ethanol
#2: 1.7 ml 95 % hydrazine

2. Add solution #2 to #1. A precipitate that immediately forms, is filtered out and washed with ethanol.
After drying at 90° C for 2.5 hours the yield is 4.45 grams.

FUN AND TOUCH EXPLOSIVES

Or : "EXTREMELY DANGEROUS COMPOUNDS"

NOTE: The following explosives are highly shock, flame and heat and even light sensitive.
Do never make great batches of them, they could cause deafness if they explode.
Some of the explosives described can even ignite by your breathing.
Do not carry them around or dry them in the direct sunlight!

All the following explosives have properties of primary explosives. But they are mostly too unstable or too shock, heat or light sensitive for use in detonators.
Some of them are really fun...

CHLORATE IMPACT EXPLOSIVES

Like all other chlorate explosives they are only handled in their wet form.
Instead of a warning let me retype a sentence of Kurt Saxon: "....While holding the plastic medicine bottle in my left hand I mixed less than a half ounce of potassium chlorate with sulphur, chalk and a small amount of red phosphorous. Suddenly my left hand was fingerless hamburger and I was also legally blind for several awful months."

MIXTURE #1:

Also known as "Armstrongs Explosive"
Mix on a paper sheet 50 % wet red phosphorus and 50 % wet potassium chlorate (both finely powdered) by lifting the different ends and corners of the paper.
Wet does not mean a few drops of water, it means a lot of water.
This mixture, when dry, explodes from fire *and* from touch with great vehemence.

You can also substitute the potassium compound with the sodium salt.
If made with the sodium salt the mixture must be hit to detonate.
MIXTURE #2:

As outlined in Weingart's "Pyrotechnics":

Part 1

Potassium Chlorate 5
Sulfur ¼
Chalk ¼

Part 2

Red Phosphorous 2

Sift the ingredients of Part 1 separately; mix thoroughly in a bowl and moisten with water to the consistency of porridge.
In another bowl, moisten the 2 ounces of phosphorous to the same consistency. Then, with a spoon, stir the phosphourus into the bowl containing the other ingredients.

MIXTURE# 3:

Materials:

Chlorate of sodium
Sulfur

1. Grind the chemicals seperately into a fine powder.

2. Place one tablespoon of sodium chlorate in the middle of a sheet A-4 paper.

3. Place ½ tablespoon of sulfur on the $NaClO_3$

4. Mix the two compounds by lifting the different corners of the sheet. This may take a little bit long until they're completely mixed, but it's the safest way to do it.

COPPER ACETYLIDE

FORMULA:
Cu_2C_2

Very shock and heat sensitive.
Red-brown crystals, explode when broken.

PREPARATION:

Chemicals:
copper sulfate
acetylene (flammable)
water

Materials:
acetylene gas generator
test tube

MANUFACTURE:

1. Dissolve 4 grams copper sulfate in 10 ml water.

2. Add a solution of 5 grams of sodium hydroxide in water

3. Mix this two liquids, and filter the white copper hydroxide.

4. Dissolve a quantity of copper hydroxide in a sufficient amount of water, and run a stream of acetylene through it.

5. A brown substance forms after a few minutes, collect it. This is copper acetylide.

DIAMINESILVER (II) CHLORATE

Fulminating compound which is light, heat, friction, shock sensitive.
Dark crystals.
Product deflagrates after filtration.

PREPARATION:

Chemicals:
silver chlorate (from silver nitrate and sodium chlorate)
strong ammonia water (25 %)

Materials:
test tube
filter paper

MANUFACTURE:

1. A near saturated solution of silver chlorate is treated with strong ammonia water(dropwise).

2. Filter out and light.

FULMINATING COPPER

NOTE: Do not confuse *FULMINATES* with *FULMINATING* compounds.

The fulminates contain a carbon atom, the fulminating compounds are mostly nitrides or hydrated nitrides of the metals.

MANUFACTURE:

Pour finely divided copper pieces or powder in a mixture of fulminating silver or gold and a little water.
Soluble green crystals are formed, they explode with a green flame.

FULMINATING GOLD

This was one of the first fulminating compounds discovered by the German alchemist Johann Thölde von Hessen.

It's a hydrated gold nitride.
Explodes easily from heat and flame with a very loud report. It's reported that it is as loud as a musquett.
The British chronicler Pepys reports in November 11, 1663 of *aurum fulminans* : "of which a grain... put in a silver spoon and fired, will give a blow like a musquett and strike a hole through the silver spoon downward, without the least force upward."

PREPARATION:

Chemicals:
ammonium chloride
nitric acid (70 % but not lower)
pure gold
potassium carbonate (carbonate of potash)

Materials:
glass beaker
teaspoon
glass rod

MANUFACTURE:

1. Dissolve 4 parts ammonium chloride in 12 or 16 parts of nitric acid.

2. Dissolve as much gold as possible.

3. Let mixture sit for a few days until all the gold dissolves.

4. Add to the gold soln. potassium carbonate solution until fulminating gold precipitates.
Filter.

5. Wash the product 6 times with water and let it dry in the dark.
Ready for use.

FULMINATING MERCURY

There are two methods for making it:

METHOD #1:

Buy in a pharmacy or in a hobby shop a few grams of red mercuric oxide (coloring agent).
Let 1 gram sit in a sealed test tube for 8- 10 days with 15 ml of strong ammonia water.
The material should become white or grayish.
After 8 or 10 days the fulminating mercury is filtered and air dried.
It explodes loudly from flame, and decomposes spontaneously.

METHOD #2:

This is not actual a fulminating compound, but makes a nice "boom" when hit or heated.

It is prepared easily by mixing 30 parts of dry, finely powdered (powder *sperately!!*) yellow oxide of mercury with 4 or 5 parts of finely powdered sulfur.

NOTE: Mercury compounds are highly toxic, skin contact should be avoided!
In case of an explosion, finely, highly toxic mercury is released into the air.

FULMINATING SILVER

This compound is more shock, friction and light sensitive than fulminating gold.

FORMULA:
NAg_3 or $NHAg_2$

It was first prepared by 1788 by Marcelin Bertholet as follows:

Make a solution of silver nitrate and water.
Add lime water or sodium hydroxide solution until a white substance precipitates (silver oxide).
To this silver oxide add dropwise strong ammonia water.
Solution should turn black.
The air dried powder explodes even in very small amounts.

Here's another recipe from "Dick's Encyclopedia of Formulas & Proccesses 1872":

Fulminating Silver. Digest oxide of silver (recently precipitated, and dried by pressure between bibulous paper) in concentrated liquor of ammonia for 12 or 15 hours, pour off the liquid, and cautiously dry the black powder in the air.
The decanted ammonia, when gently heated, yields, on cooling, small crystals, which possess a still more formidable power of detonation, and will scarcely bear touching, even while under the liquid.
This compound is exploded by the slightest friction or percussion, and should therefore be made in very small quantities at a time, and handled with great caution. Its explosive power is tremendous; in fact, it can hardly be handled with safety, even in the moist state. Many frightful accidents have happened from the spontaneous explosion of this substance. At most 1 or 2 grains (0,02g) can be exploded with safety at one time.

NITROGEN TRICHLORIDE

Synonym: "Chloride of Azode"

FORMULA:
NCl_3

This is often published, but I add another way for making it.

Have great care in making this compound. It explodes when heated above 93° C or when hit.
It also explodes on contact with rubber, cork, common dust and other organic material.
Direct sunlight must be avoided.
The explosion of 1-2 grams can cause deafness.
Compounds, especially chlorine is highly toxic.
Nitrogen trichloride is also toxic.
Do not breath in vapors.

PREPARATION #1:

1. Fill a beaker with a solution of ammonium nitrate, chloride or sulfate. Fertilizer must contain at least 33.3 % ammonium nitrate, sulfate or chloride.

2. Take your chlorine generator and bubble in slowly chlorine.
Small drops on top of solution should form.
Do not let temperature rise above 60° C.

3. Remove the oily liquid and store dark in a clean container.

NOTE: This explosive is highly unstable and may explode for no reason!

PREPARATION #2:

Chemicals:
ammonium chloride (made from NH_3 and HCl)

Materials:
car battery or battery charger
very clean carbon or lead rods (from a battery)

MANUFACTURE :

1. Fill the glass beaker with a saturated solution of ammonium chloride in water.
(for more safety place the beaker in an ice bath)

2. Connect the rods to the charger or battery and place in the solution.
Avoid metal (except lead and platin) contact with this solution!
After a few minutes NCl_3 will form as a yellow oil.
The electrolysis is continued until no more NCl_3 forms.
Watch the temperature.
Remove as above.
Place the rods in the middle of the solution.

NITROGEN TRIIODIDE

FORMULA:
NI_3

This is also very often published. For completeness I repeat it.

DANGER: This explosives is the most unstable of all. Do not place in the sun. Do not breath over this dry explosive.
1 teaspoon of NI_3 crystals has the impact power of a M-80.

PREPARATION:

Chemicals:
iodine crystals
strong ammonia water

Materials:
filter paper
glass beaker

MANUFACTURE:

1. Take some iodine crystals (2 g).
2. In a glass beaker pour down 25 ml of strong ammonia water.

3. Add the iodine crystals and let mixture react (under shaking after each 2 minutes) for 10 min.

4. Let the nitrogen triiodide settle to the bottom.

5. Filter out and blast.

SILVER ACETYLIDE

FORMULA:
Ag_2C_2

This highly shock and light sensitive.

PREPARATION:

Chemicals:
ammonia water (10 % is okay)
silver nitrate (see elsewhere above)
acetylene
water

Materials:
test tube
acetylene generator

MANUFACTURE:

1. Make a 3% solution of silver nitrate in water.

2. Add ammonia water until it precipitates and dissolves again.

3. Bubble acetylene through the solution until no more silver acetylide precipitates.

Filter and store dark.

SILVER FULMINATE

FORMULA:
AgONC

VoD:

3600 m/s

EQUIVALENCE:
Use 1 gram in a cap.

SENSITIVITY:
This is one of the compounds never should made if other primary explosives are available.
Detonates in small quantities. Light sensitive. Friction sensitive.

DRAWBACKS:
Light sensitive, there are other choices for more powerful primaries.

COMPATIBILITY:
Bad.
Avoid metal contact.

"YELLOW POWDER"

This is a "forgotten" fun explosive.
It's very easy to make from common accessible items.
The manufacturing is not dangerous in any way.
This powder burns 8.5 times faster than the best commercial black powder.
If it's pressed in a tube, no detonation occurs, but when the powder is molten upon an iron plate in its uncompressed form, it first turns brown and then it detonates with a loud "bang".

1. Mix 4 grams of dry potassium nitrate and 2 grams of dry potassium carbonate (baking ingredient)
in a mortar and pestle. Grind together to a fine powder.

2. Weigh out 4.5 grams of the above powder
and add 1 part of sulfur. Grind carefully together.

This light yellow powder explodes heavily when molten by a match flame, etc.
Store airtight.
Try detonating it in metal tubes.
It's not shock sensitive.

This is *fulminating powder,* made, according to Ure's ,,Dictionary of Chemistry," first American edition, Philadelphia, 1821:

by triturating in a warm mortar, three parts by weight of nitre, two of carbonate of potash, and one of flowers of sulfur. Its effects, when fused in a ladle, and when set on fire, are very great. The whole of the melted fluid explodes with an intolerable noise, and the ladle is commonly disfigured, as if it had received a strong blow downwards.

Samuel Guthrie, Jr. *(cf. Archeion,* 13, 11 jr. [19311), manufactured and sold in this country large quantities of a similar material. In a letter to Benjamin Silliman dated September 12, 1831 *(Am. J. Sci. Arts,* 21, 288 if. [1832]), he says:

I send you two small phials of nitrated sulphuret of potash, or yellow powder, as it is usually called in this country. . . I have made some hundred pounds of it, which were eagerly bought up by hunters and sportsmen for *priming* fire arms, a purpose which it answered most admirably; and, hut for the happy introduction of powder for priming, which is ignited by percussion, it would long since have gone into extensive use.

With this preparation I have had much to do, and I doubt whether, in the whole circle of experimental philosophy, many cases can be found involving dangers more appalling, or more difficult to be overcome, than melting fulminating powder and saving the product, and reducing the process to a business operation. I have had with it some eight or ten tremendous explosions, and in one of them I received, full in my face and eyes, the flame of a quarter of a pound of the composition, just as it had become thoroughly melted.

The common proportions of 3 parts of nitre, 2 parts of carbonate of potash and 1 part of sulphur, gave a powder three times quicker than common black powder; but, by *melting together* 2 parts of nitre and 1 of carbonate of potash, and when the mass was cold adding to 4½ parts of it, 1 part of sulphur-equal in the 100, to 54.54 dry nitre, 27.27 dry carbonate of potash and 18.19 sulphur-a greatly superior composition was produced, burning no less than eight and one half times quicker than the best common powder. The substances were intimately ground together, and then melted to a *waxy* consistence, upon an iron plate of one inch in thickness, heated over a muffled furnace, taking care to knead the mass assiduously, and remove the plate as often as the bottom of the mass became pretty slippery.

By the previously melting together of the nitre and carbonate of potash, a more intimate union of these substances was effected than could possibly be made by mechanical means, or by the slight melting which was admissible in the after process; and by the slight melting of the whole upon a *thick* iron plate, I was able to conduct the business with facility and safety.

The melted mass, after being cold, is as hard and porous as pumice stone, and is grained with difficulty; but there is a stage when it is cooling in which it is very crumbly, and it should then be powdered upon a board, with a small wooden cylinder, and put up hot, without sorting the grains or even sifting out

the flour.

This is a reprint of
"The Chemistry of Powder & Explosives"
by Tenney L. Davis, page 31.

Silveroxalate

This is a very insensitive and a "tough to detonate" explosive. But it is one.

Chemicals:

Silver
Nitric acid
Sodium oxalate or potassium oxalate
Water

Preperation:

1. Dissolve some silver in nitric acid.
2. Dissolve some oxalate in water.
3. Pour the oxalate solution to the silver nitrate solution.
4. Filter the white precipitate, let dry. This is the silveroxalate. It explodes on heating without direct contact of a flame.

END

Follow the well-known safety rules.
Primary explosives are the most dangerous compounds anyone can make.

Most accidents in which explosives are involved which are happened, are caused by the careless handling of primary explosives and detonators.